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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/708,042	02/04/2004	Di-Jia Liu	19441-0058	2041
29052 7590 12/20/2007 SUTHERLAND ASBILL & BRENNAN LLP 999 PEACHTREE STREET, N.E. ATLANTA, GA 30309			EXAMINER DOVE, TRACY MAE	
			ART UNIT 1795	PAPER NUMBER
			MAIL DATE 12/20/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/708,042	Applicant(s) LIU ET AL.	
	Examiner Tracy Dove	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 October 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3 and 5-20 is/are pending in the application.
- 4a) Of the above claim(s) 13-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3 and 5-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This Office Action is in response to the communication filed on 10/9/07. Applicant's arguments have been considered, but are moot in view of the new grounds of rejection. Claims 1, 3 and 5-20 are pending. Claims 13-20 are withdrawn from consideration.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3 and 6-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baker et al., US 4,182,795 in view of Paz, US 2005/0053819.

Baker teaches a solid oxide fuel cell (3:1-25) having an anode 114, a cathode 112 and an electrolyte layer 116 there between. Separator plate 118 has passages for supplying process gas to the cathode and separator plate 120 has passages for supplying fuel gas to the anode (Figure 5). The separator plate 120 includes a catalyst coating 121 for hydrocarbon reforming (7:42-65). As shown in Figure 5, neither the portion of separator 120 that contacts the anode 114 nor the base of the separator contains catalyst 121. Wherein the hydrocarbon content is methane, a suitable steam-reforming catalyst is nickel or nickel based (transition metal) (6:67-7:8).

Baker does not explicitly state the interconnect substrate is formed of high temperature stainless steel/alloy plate (claim 3), the solid oxide electrolyte comprises yttria-stabilized zirconia (claim 12) or the catalyst coating comprises a catalyst support and/or catalyst promotor (claim 10) in addition to the steam reforming catalyst disclosed by Baker.

However, Paz teaches the use of an internal fuel reforming catalyst coating on an interconnect that connects individual solid oxide fuel cells. The catalyst coating enhances the rate of internal fuel reformation and improves the thermal efficiency of the fuel cell (0002). As shown in Figure 1, the interconnects sandwich the cathode/electrolyte/anode solid oxide fuel cell structure. The interconnects have flow field channels for the fuel gas and the oxidant gas. The catalyst coating is in fluid communication with the hydrocarbon fuel and preferably includes a base metal and a precious metal (0016). The fuel reformation catalyst is applied to a portion of the surface of the interconnect opposite the anode of the fuel cell or to a portion of the interconnect that is in communication with the fuel provided to the anode (0034). The interconnect is preferably a metallic or ceramic material having the desired shape to effect the interconnection, depending on the type of SOFC prepared. The metallic interconnect may be made from ferritic stainless steel (0054). Additionally, CeO_2 may be used with the precious metal to further improve catalysis. Al_2O_3 or ZrO_2 may be used as a catalyst support material (0031). The solid electrolyte may be yttria-stabilized zirconia (YSZ) (0044).

Therefore, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because one of skill would have been motivated to use common materials known in the art for the interconnect substrate, solid electrolyte and catalyst coating. Furthermore, Paz teaches the catalyst coating enhances the rate of internal fuel reformation and improves the thermal efficiency of the fuel cell (0002). Baker teaches a solid oxide fuel cell. Yttria-stabilized zirconia (YSZ) is one of the most common solid electrolyte materials employed in solid oxide fuel cells. Both Baker and Paz are directed toward solid oxide

fuel cells and one of skill would have found it obvious to use the materials of the solid oxide fuel cell of Paz for the materials of the solid oxide fuel cell of Baker.

*

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Baker et al., US 4,182,795 in view in view of Paz, US 2005/0053819 and further in view of Fujiwara et al., JP 06-068887. See discussion of Baker and Paz above regarding claim 1.

Baker does not explicitly teaches the anodic interconnect includes a plurality of rows of fins wherein adjacent rows are offset from one another. However, Fujiwara teaches a separator for a fuel cell comprising a corrugated material, which is continuously bent into a U-shape, and which is offset at a fixed length, is used for the interconnect of the anode side of the fuel cell (abstract). Therefore, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because one of skill would have been motivated to use the known fuel cell interconnect structure of Fujiwara for the fuel cell interconnect structure of Fujiwara. The interconnect structure of Fujiwara provides a large surface area, reduces contact resistance with the anode, can be used at a high surface pressure and allows for control of pressure loss (abstract).

Response to Arguments

Applicant's arguments filed 10/9/07 have been fully considered but are moot in view of the new grounds of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tracy Dove whose telephone number is 571-272-1285. The examiner can normally be reached on Monday-Thursday (9:00-7:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

December 18, 2007


TRACY DOVE
PRIMARY EXAMINER